Dart Aerospace L	.ta
------------------	-----

	oopass								
W/O:		· · · · · · · · · · · · · · · · · · ·	WO	RK ORDER CHANGI	ES				
DATE	STEP	PRO	OCEDURE CHAN	IGE	Ву	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector
				•					
Part No	:	PAR #:	Fault Categ	jory:	NCR: Yes	No DC	A:	Date: _	
	R	esolution:	Disposition	l:	QA: N/C C	losed:		Date: _	***
NCR:			WORK ORDE	R NON-CONFORMA	NCE (NC	R)			
		Description of NC		Corrective Action Section		Verif	cation	Approval	Approval
DATE	STEP	Description of NC Section A	Initial Chief Eng	Action Description Chief Eng	Sign Date	& Sec	tion C	Chief Eng	QC Inspector
, , , , ,									
1			I I		1	1		1	1

Work Order ID 78422 *78422* Page 2 January-09-12 11:14:23 AM Item ID: D212-664-207TRN Accept *N900040100* Setup Start **Revision ID:** Item Name: Crosstube Turning Detail **Start Date:** 09/01/2012 Start Oty: 1.00 **Cust Item ID: Required Date:** 11/01/2012 Reg'd Oty: 1.00 **Customer:** Reference: Start Run Process Plan: **Approvals:** Date: _____ **Tooling:** Date: Stop Date: OC: SPC (Y/N): Date: Sequence ID/ Operation Set Up/ Tool # Plan Tool ID Reject Reject Accept Insp. **Work Center ID** Description **Run Hours** Code Qty **Qty** Number Stamp 120 0.00 MORI SEIKI CNC LATHE LARGE *120* Mori Seiki 0.00 Memo Mori Seiki CNC Lathe Large 1-Turn second side as per Folio FA706 2- File transition lines smooth. 3-Remove sand and alugs FOLIO REV: DWG REV: 130 QC1- Inspect dimensions to dimension sheet 0.00 *120* QC 0.00 Memo Quality Control

140

Quality Control

140

QC

Memo

QC8- Inspect parts - second check

0.00

0.00

Dart A	erospace	Ltd
--------	----------	-----

W/O:			WO	RK ORDER CHAN	GES			
DATE	STEP	PR	OCEDURE CHAN	NGE	Ву	Date Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector
							!	
Part No:		PAR #:	Fault Categ	jory:	NCR: Yes	No DQA :	Date: _	
	Re	solution:	Disposition);	QA: N/C Cld	osed:	Date: _	· · · · · · · · · · · · · · · · · · ·
NCR:			WORK ORDE	R NON-CONFORM	IANCE (NCR)		
DATE	STEP	Description of NC	ļ		ection B Sign &	Verification	Approval	Approval
DVÍT	0,2,	Section A	Initial Chief Eng	Action Description Chief Eng	Date	Section C	Chief Eng	QC Inspector
				-				
			3					
				*				

Work Order ID 78422 *78422* Page 3 January-09-12 11:14:23 AM Item ID: D212-664-207TRN Accept *N900040100* Setup Start **Revision ID:** Crosstube Turning Detail Item Name: 09/01/2012 Start Qty: 1.00 **Start Date: Cust Item ID: Required Date:** 11/01/2012 Req'd Qty: 1.00 **Customer:** Reference: Start Run Approvals: Process Plan: ____ Date: Tooling: Date: Stop OC: ____ Date:___ SPC (Y/N): Date: Sequence ID/ Operation Set Up/ Tool ID Tool # Plan Reject Accept Reject Insp. **Work Center ID** Description Qty Qty Number Stamp **Run Hours** Code 145 0.00 *145* Crosstubes 0.00 Memo Crosstubes GRIND ONLY TRANSITION LINES SMOOTH LONGITUDE WAY. 12-1-13 150 Crosstubes Chemical Conversion 0.00 *150* HandFXtube 0.00 Memo Hand Finishing Crosstubes 12-1-16 160 QC3-Inspect Part Finish 0.00 *160* QC 0.00 Memo

Quality Control

Dart Ae	rospace	e Ltd								ი
W/O:			WO	RK ORDER CHA	ANGES					
DATE	STEP	PRO	CEDURE CHAI	NGE		Ву	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector
Part No		PAR #:								
	R	esolution:	Disposition	1:	QA	: N/C Clo	sed:		Date: _	
NCR:		V	VORK ORDE	R NON-CONFO	RMANCE	(NCR)			
		Description of NC		Corrective Action	Section B		Verific	cation	Approval	Approval
DATE	STEP	Section A	Initial Chief Eng	Action Descript Chief Eng	tion 	Sign & Date		on C	Chief Eng	QC Inspector
	-									

Work Order ID 78422 *78422* January-09-12 11:14:23 AM Item ID: D212-664-207TRN Accept *N900040100* Setup Start **Revision ID:** Crosstube Turning Detail Item Name: **Start Date:** 09/01/2012 Start Qty: 1.00 **Cust Item ID: Required Date:** 11/01/2012 Req'd Qty: 1.00 **Customer:** Reference: Run Start Approvals: Process Plan: ____ Date: **Tooling:** Date: Stop QC: Date: SPC (Y/N): Date: Sequence ID/ **Operation** Tool # Plan Set Up/ Tool ID Reject Accept Reject **Work Center ID** Description **Run Hours** Otv Code Oty Number Stamp 170 0.00 Packaging *170* Packaging 0.00 Memo Packaging Identify and stock in kanban rack Location:

180

QC21- Final Inspection - Work Order Release

0.00

120

Quality Control

QC

Memo

0.00

Insp.

Page 4

Dart Aerospace	Ltd
----------------	-----

W/O:			WC	RK ORDER CHANGI	ES				
DATE	STEP	PRO	OCEDURE CHAI	NGE	Ву	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector
Part No	-	PAR #:	Fault Cate	gory:	NCR: Yes	No DQ	A:	Date: _	
	R	esolution:	Disposition	1:	QA: N/C	Closed:		Date: _	
NCR:	,		WORK ORDE	R NON-CONFORMA	NCE (NC	R)			
DATE	STEP	Description of NC		Corrective Action Section			cation	Approval	Approval
DAIL	J.L.	Section A	Initial Chief Eng	Action Description Chief Eng	Sign Date		ion C	Chief Eng	QC Inspector
		·							
				4-0-0					
					ļ				
		1	1		- 1			l	1

Picklist Print

January-09-12 11:14:27 AM

Work Order ID: 78422 *78422*

Parent Item:

D212-664-207TRN *D212-664-207TRN* Parent Item Name: Crosstube Turning Detail

Start Date: 09/01/2012

Required Date: 11/01/2012

Page 1

Start Qty: 1.00

Required Qty: 1.00

Comments:

IPP Rev:A New Issue 08-03-06 DD verified by:ec IPP Rev B 08.04.02 Removed polish EC verified DD

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
D6008-132	•	Manufactured	No			110	Each	0.0000	1	1			
D6008-13	32								**				

Crosstube extrusion

D6008-180

59249

2191-L 12/0\$/09

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES								
DATE	STEP	PROCEDURE CHANGE	Ву	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector			
		, •								
		·								
	<u></u>		 	<u> </u>	l	<u> </u>	<u> </u>			

Part No:	PAR #:	Fault Category:	 NCR: Yes No	DQA:	Date: _	
Resolution:		Disposition:	 QA: N/C Closed	1:	Date: _	

NCR:		WORK ORDER NON-CONFORMANCE (NCR)									
		Description of NC		Corrective Action Section B	, , , , , , , , , , , , , , , , , , , ,	Verification	Approval	Approval			
DATE	STEP	Section A	Initial Chief Eng			Sign & Section C		QC inspector			
		`\									
					·						
					:						
	1				I						

DART AEROSPACE LTD	Work Order:	78422
Description: Crosstube Assembly (205/212 Low Aft)	Part Number:	D212-664-247
Inspection Dwg: D212-664-247 Rev: B		Page 1 of 1

FIRST ARTICLE INSPECTION CHECKLIST

In	spection Sheet	Tolerance	Actual	Accept		Method of	_
Dra	wing Dimension	loierance	Dimension	Accept	Reject	Inspection	Comments
	0.438	+/-0.010	. 436			vern	CNC-OX
	2.680	+0.005/-0.000	2,684			1	
	2.680	+0.005/-0.000	12.685				
	2.687	+0.005/-0.000	2.691				
	2.802	+0.005/-0.000	2-805				
_	2.906	+0.005/-0.000	2.907				
EA	3.009	+0.005/-0.000	3.012		<u> </u>		
SIDE	3.112	+0.005/-0.000	3.114	/			
	3.250	+0.005/-0.000	3.250				
	2.400				-	10	
	0.438	+/-0.010	,436			vern	CNC-CX
	2.680	+0.005/-0.000	2-684				
ļ	2.680	+0.005/-0.000	2.684				
	2.687	+0.005/-0.000	2691	-			
ļ	2.802	+0.005/-0.000	7.804				
a	2.906	+0.005/-0.000	2-908				
핃	3.009	+0.005/-0.000	3.012				
SIDE	3.112	+0.005/-0.000	5-117				:
	3.250	+0.005/-0.000	3.250			٦	
}							
}					,		4.5-
-	74		_				
	128.268	+/-0.030	128.265	~		tope	200M.6-02

Measured by: Audited by: Preliminary Approval: N/A

Date: 12/01/10 Date: 12-1-12 Date: N/A

Rev	Date	Changé	Revised by	Approved
Α	08.11.07	New Issue (P/O D212-664-207)	KJ/EC	
В	10.04.01	Dwg Rev updated	KJ IA	Al
C	10.08.03	Dimension 128.268 was 128.27	KJ KJ	/ <u>//</u> /

Dart Aerospace	Ltd	
----------------	-----	--

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	Ву	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector
			***. •				
			*				

Part No: _		PAR #:	Fault Category: _	<u> </u>	NCR: Yes No	DQA:	Date:	
	Resolution:		Disposition:		QA: N/C Closed	l:	Date:	

NCR:		WORK ORDER NON-CONFORMANCE (NCH)								
,		Description of NC	Corrective Action Section B		Verification	Approval	Approval			
DATE	STEP	Section A	Initial Chief Eng	Action Description Chief Eng	Sign & Date	Section C	Chief Eng	QC Inspector		
	*									
					100					
					•					
					,					
	1 1							1		

Item	Qty -247	Qty -247B	Part Number	Description
1	Х		D212-664-247	CROSSTUBE ASSEMBLY (205/212 LOW AFT)
2		Х	D212-664-247B	CROSSTUBE ASSEMBLY (214 LOW AFT)
3	1	1	D6008-132	CROSSTUBE
4	2	2	D2940-1	SUPPORT
5	4	4	D3595-063-530	RUBBER CUSHION
6	2	2	D3660-1	CUFF
7	4	4	MS21920-28	CLAMP (OR MS21920-30)
_8	44	44	CR3212-4-06	RIVET (OR M7885/3-4-06)
9	A/R	A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299-947-100, TYPE II, CLASS 2 ADHESIVE)
10	A/R	A/R	SIKAFLEX-241/-291	SEALANT (OR PROSEAL 890 OR MIL-S-8802 CLASS B2 SEALANT)

GENERAL NOTES:

1) MATERIAL: MANUFACTURED FROM D6008-132

FINISHED LENGTH = 128.268±0.020 (BEFORE BENDING/TRIMMING)

2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1 PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2 PAINT OUTSIDE PER DART QSI 005 4.2

3) TOLERANCES ARE PER DART QSI 005 4.2
4) UNITS: INCHES UNITES AND THE SHAPE AS A THE SHAPE AS A

UNITS: INCHES UNLESS OTHERWISE NOTED.

BREAK SHARP EDGES: 0.05 TO 0.010 MAX.

IDENTIFICATION: SCRIBE DART PART NUMBER "D212-664-XXX" AND BATCH NUMBER ON INSIDE OF CUFF USING VIBRATING STYLUS.

WEIGHT: D212-664-247 = 36.6 lbs (PER IIN-D212-664)
D212-664-247B = 36.6 lbs (PER IIN-D212-664)
PART IS SYMMETRIC ABOUT CENTERLINE.

WHEN MACHINING TAPER, RUN CUTTER OFF PART. BLEND OUT EDGE LONGITUDINALY, TRANSITION SHOULD

10) BEND PROGRESSIVELY WITH A MINIMUM OF 8 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 6% BASED ON O.D., EXCEPTUP TO 10% IS ALLOWED IN AREA NOTED.

11) LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER OSI 038

12) INSTALL D2940-1 SUPPORT USING 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 TO THE SURFACE OF D2940-1 THAT WILL BE IN CONTACT WITH THE CROSSTUBE PER QSI 015. LET CURE FOR 12 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.

13) INSTALL MS21920-28 CLAMPS (OR -30) WITH D3595-063-530 RUBBER CUSHIONS TO SECURE THE D2940-1 SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMPS ARE OPPOSITE OF CROSSTUBE SUPPORT.

14) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.

15) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.

16) INSTALL D3660-1 CUFF AFTER CHEMICAL CONVERSION COAT BUT BEFORE PAINT, WITH A LAYER OF SIKAFLEX-241/-291 OR PROSEAL 890 OR MIL-S-8802 CLASS B2 SEALANT BETWEEN CUFF AND CROSSTUBE. SEAL EDGE OF CUFF TO ENSURE NO GAPS.

17) TOUCH-UP HOLES WITH CHEMICAL CONVERSION COAT.

COPY RNTO TRING TED CO5A U CNDMENT St TICE 78422 M.C.J 12/01/09

DEO ATTACHED

С

DGV#11-614 11.07.28

В		E GENERAL N	RF	09.09.30			
A	NEW IS		RDS: ADD -247B (ZN C4-2, D5-2)	CP	07.07.07		
REV.			DESCRIPTION	BY	DATE		
DESIGN		q)	DART AEROSPACE LTD				
DRAWN		RF	HAWKESBURY, ONTARIO, CANADA				
CHECK	D	9	DRAWING NO. REV. B				
MFG. AF	PPR.	77	D212-664-247		SHEET 1 OF 4		
APPRO\	/ED	NO	TITLE		SCALE		
DE APP	R.		CROSSTUBE (205/212 LOW AFT) NTS				
DATE 09.09.30			COPYRIGHT © 2007 BY DART A THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIE HIGT TO BE USED FOR ANY PERFOSE OR CONSIDER WHITTEN PERMISSION FROM DART AS	DON THE EXPR	IESS CONCITION THAT IT IS		

6

5

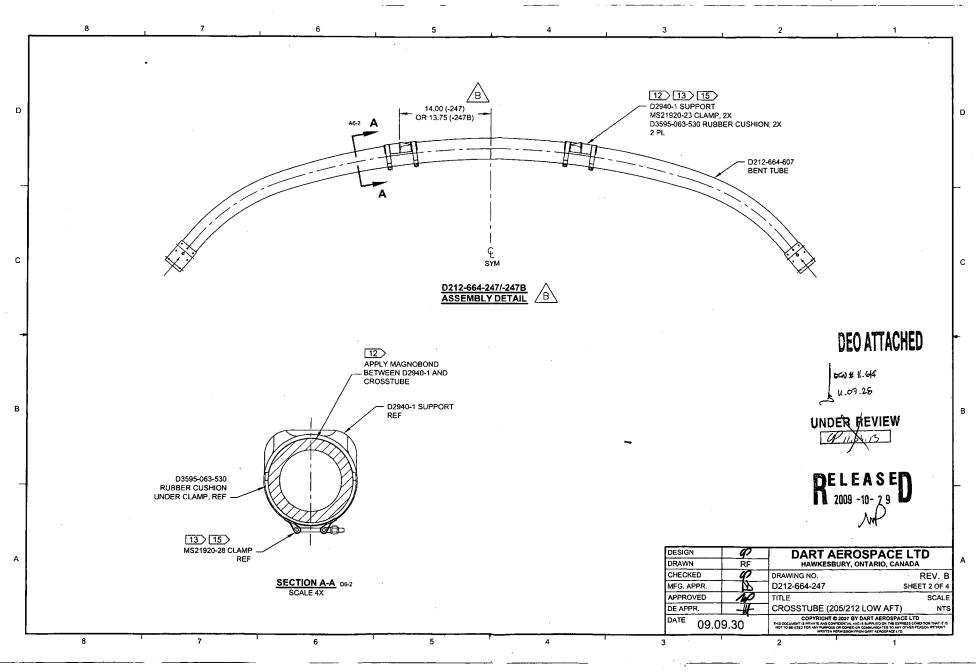
D

Dart	Aeros	pace	Ltd
------	--------------	------	-----

W/O:		WORK ORDER CHANGES									
DATE	STEP	PROCEDURE CHANGE	Ву	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector				
					į						
					L		1				

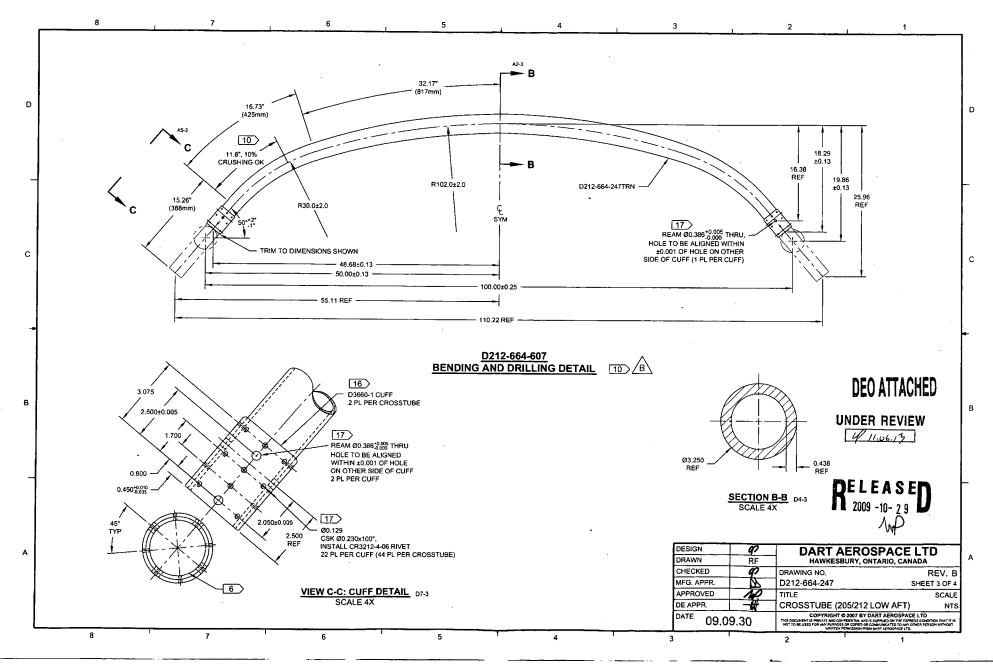
Part No:		PAR #:	Fault Category:	NCR: Yes No	DQA:	Date:
	Resolution:		Disposition:	QA: N/C Closed	l:	Date:

NCR:		WORK ORDER NON-CONFORMANCE (NCR)							
		Description of NC Corrective Action Section B			Verification App	Approval	Approval		
DATE	STEP	Section A		Chief Eng	QC Inspector				



Dart Ae	rospace L	.td					•.
W/O:			WORK ORDER	CHANGES			
DATE	STEP	PR	OCEDURE CHANGE	Ву	Date	Approval Chief Eng / Prod Mgr	Approval QC Inspector
							
Part No	:	PAR #:	Fault Category:	NCR: Yes	No DQA:	Date: _	
	Res	olution:	Disposition:	QA: N/C C	losed:	Date: _	
NCR:			WORK ORDER NON-CON	IFORMANCE (NC	R)		
		Description of NC	Corrective Action	n Section B	Verificat	ion Approval	Approval

NCR:			WORK ORDE	ER NON-CONFORMAN	CE (NCR)			
		Description of NC	Corrective Action Section B				Approval	Approval
DATE	STEP	Section A	Initial Chief Eng	Action Description Chief Eng	Sign & Date	Verification Section C	Chief Eng	QC Inspector
					į			
						_		



Dart Aerospace Ltd	Dar	t Ae	rosp	ace	Ltd
--------------------	-----	------	------	-----	-----

W/O:		WORK ORDER CH	ANGES				
DATE	STEP	PROCEDURE CHANGE	Ву	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector
				s		· .	
Part No):	PAR #: Fault Category:	NCR: Yes	No DQ	A:	Date: _	

Disposition:

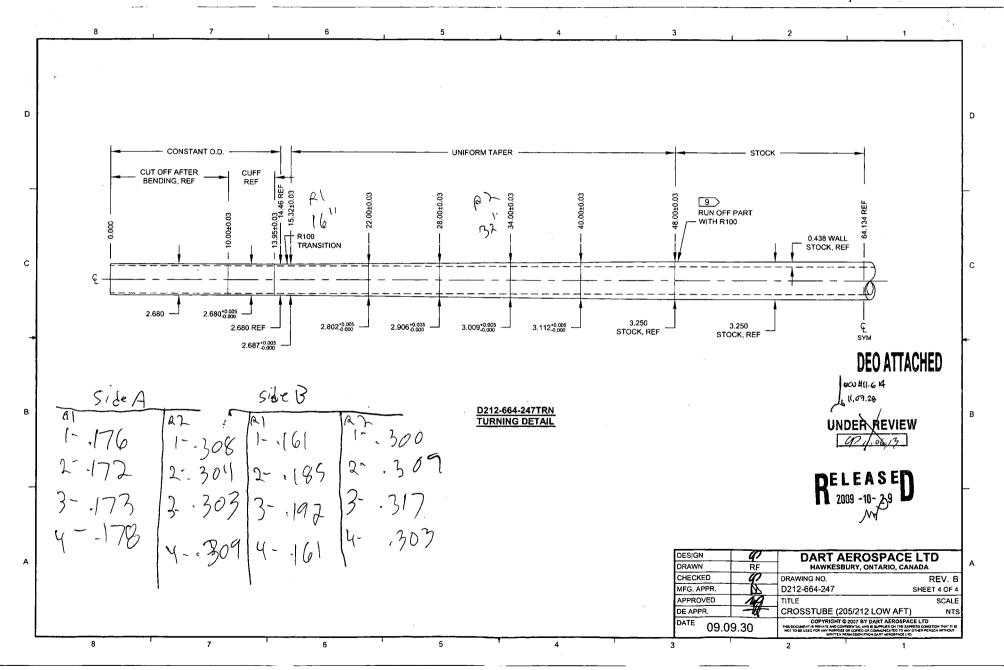
Date: ______

QA: N/C Closed: ____

NCR: WORK ORDER NON-CONFORMANCE (NCR)								
	T	Description of NC	Corrective Action Section B			Verification.	Approval	Approval
DATE	STEP	Section A	Initial Chief Eng	Action Description Chief Eng	Sign & Date	Section C	Chief Eng	QC Inspector
		•						
							•	

NOTE: Date & initial all entries

Resolution:



W/O:		WORK ORDER CH	HANGES				
DATE	STEP	PROCEDURE CHANGE	Ву	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector
			-				

Part No:	_ PAR #:	Fault Category:	NCR: Yes No	DQA:	Date:
Resolution:		Disposition:	QA: N/C Closed	1:	Date:

NCR: WORK ORDER NON-CONFORMANCE (NCR)										
				Description of NC	Corrective Action Section B					Approval
DATE	STEP	Section A	Initial Chief Eng	Action Description Chief Eng	Sign & Date	Verification Section C	Approval Chief Eng	QC Inspecto		
								1		
				•						
•										
•										

DRAWING NO. D212-664-247	TITLE CROSSTUBE ASS'Y (26	REV. B 05 LOW AFT)	DART AEROSPACE LTD ENGINEERING ORDER	D.E.O. NO. D212-664-247-B-1	SHEET NO. SHEET 1 OF 1	SCALE NTS
DRAWN q	CHECKED	ASS	MFG. APPR.	APPROVED W	DE APPR.	1410
DATE 11.07	.15 DATE //,	27.70	DATE 11.07.21	DATE 11/07/2)	DATE (1.07.21	

PURPOSE:

REPLACE MAGNOBOND WITH PROSEAL.

CHANGE:

IS:

Item	Qty -247	Qty -247B	Part Number	Description
9	A/R	A/R	PROSEAL 890 B-2	SEALANT, AMS-S-8802 CLASS B-2

WAS:

	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299-947-100, TYPE II, CLASS 2 ADHESIVE)

NOTE 12 & 15, SHEET 1 IS AMENDED AS FOLLOWS:

- 12) TO INSTALL D2940-1 SUPPORT: ABRADE MATING SURFACE OF SUPPORT AND CROSSTUBE WITH 180-GRIT SANDPAPER AND REMOVE RESIDUE WITH MEK (OR EQUIVALENT). APPLY A 0.04" TO 0.07" THICK LAYER OF PROSEAL 890 CLASS B-2 (OR AMS-S-8802 CLASS B-2) SEALANT TO MATING SURFACE OF SUPPORT
- 15) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING. PRIOR TO PACKAGING, RE-CHECK TORQUE ON CLAMPS AFTER PROSEAL 890 SEALANT HAS CURED FOR 72 HOURS.

WAS:

- 12) INSTALL D2940-1 SUPPORT USING 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 TO THE SURFACE OF D2940-1 THAT WILL BE IN CONTACT WITH THE CROSSTUBE PER QSI 015. LET CURE FOR 12 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.
- 15) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.



COPYRIGHT © 2011 BY DART AEROSPACE LTD

THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT

	D	ar	t ,	A	er	O	S	p	а	C	е	L	td	
--	---	----	-----	---	----	---	---	---	---	---	---	---	----	--

W/O:		WORK ORDER CHA	WORK ORDER CHANGES								
DATE	STEP	PROCEDURE CHANGE	В	y Da	te Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector				
			./								
		- <u> </u>									
							g 518				
	1		<u> </u>								

Part No:	_ PAR #:	Fault Category:	NCR: Yes No DQA:	Date:
Resolution:		Disposition:	QA: N/C Closed:	Date:

NCR:		\	WORK ORDE	ER NON-CONFORMANO	CE (NCR)			•
		Description of NC		Corrective Action Section B	Verification	Approval	Approval	
DATE	STEP	Section A	Initial Chief Eng	Action Description Chief Eng	Sign & Date	Section C	Approval Chief Eng	Approval QC Inspector
)				**************************************	, ; ;		
·								,
		, .				1. 2.		
				*			·	
			. 5-					
		·						
	1							
								st.